

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

: **BOX: Patent Application**

David SILAGY et al.

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: Examiner: Not yet assigned

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For: THERMOFORMING MULTILAYER FILM FOR PROTECTING
SUBSTRATES, AND OBJECTS OBTAINED

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

SIR:

Prior to examination, please amend the above-identified application as follows
and consider the remarks:

IN THE CLAIMS

Please amend the claims as follows:

1. (Amended) A thermoforming multilayer film comprising, successively:

- at least one layer chosen from layers (A1) and (A2) such that if (A2)
- is present, then (A2) is placed next to an optional layer (B1),
- an optional layer (B1),
- a layer (B2),
- a layer (B3),
- an optional layer (B4),

wherein said layer (A1) comprises a fluoropolymer (A111) or a polymer
(A112) consisting essentially of alkyl(meth)acrylate units or a blend of the
two,

said layer (A2) consists of ink,

said layer (B1) comprises a fluoropolymer (B111) or a polymer (B112) consisting essentially of alkyl(meth)acrylate units or a blend of the two,
said layer (B2) is based on polyamide with amine end groups,
said layer (B3) consists of a polyolefin functionalized with an unsaturated carboxylic anhydride, and
said layer (B4) comprises polyolefin.

2. (Amended) The film according to Claim 1, wherein said layer (A1) is replaced with two layers (A11) and (A12), the order of the layers being as follows:

• (A11), + (A12), + optional (A2), + optional (B1), + (B2), + (B3), + and optional (B4).

3. (Amended) The film according to claim 1, wherein said fluoropolymers (B111) and (A111) are PVDF.

4. (Amended) The film according to claim 1, wherein said polymers (B112) and (A112) are PMMA.

5. (Amended) The film according to claim 1, wherein the polyamide of said layer(B2) is chosen from PA 6, PA 12, and PA 6/6-6.

6. (Amended) The film according to claim 1, wherein the functionalized polyolefin of the layer (B3) is grafted polypropylene optionally diluted with polypropylene, EPR rubber, EPDM rubber or copolymers of propylene and of an α -olefin.

7. (Amended) The film according to claim 1, wherein the functionalized polyolefin of the layer (B3) results from a co-grafting of a blend of polypropylene and of EPR or EPDM.

8. (Amended) The film according to any claim 1, wherein the functionalized polyolefin of the layer (B3) is a blend comprising, by weight:

- 0 to 50% of at least one polyethylene or one ethylene copolymer,
- 50 to 100% of at least one polymer chosen from polypropylene or a propylene copolymer, poly(1-butene) homopolymer or copolymer and polystyrene homopolymer or copolymer,
- wherein said blend is grafted with an unsaturated carboxylic anhydride,

and

- wherein said-blend is optionally diluted in at least one polyolefin essentially comprising propylene units or in at least one polymer of elastomeric nature or in a blend thereof.

9. (Amended) The film according to claim 1, wherein the polyolefin of layer (B4) is polypropylene.

10. (Amended) A substrate coated with a film according to claim 1, wherein the layer (B3), is next to the substrate.

11. (Amended) The substrate according to Claim 10, comprised of polypropylene.

Please add the following NEW claims:

12. The film according to claim 1, comprising a layer (B1).

13. The film according to claim 1, comprising a layer (B4).

14. The film according to claim 2, comprising a layer (A2).

15. The film according to claim 2, comprising a layer (B4).

16. The film according to claim 8, wherein the functionalized polyolefin of the layer (B3) is a blend comprising, by weight 10 to 40% of at least one polyethylene or one ethylene copolymer,
60 to 90% of at least one polymer chosen from polypropylene or a propylene copolymer, poly(1-butene) homopolymer or copolymer and polystyrene homopolymer or copolymer,
wherein said blend is grafted with an unsaturated carboxylic anhydride, and wherein said grafted blend is optionally diluted in at least one polyolefin essentially comprising propylene units or in at least one polymer or elastomeric nature or in a blend thereof.

17. The film according to claim 8, wherein said grafted blend is diluted in at least one polyolefin essentially comprising propylene units or in at least one polymer of elastomeric nature or in a blend thereof.

18. The film according to claim 1 produced by a process of co-extrusion.

19. The film according to claim 18, wherein said process of co-extrusion is used to produce at least two layers of said film.

20. The film according to claim 1, wherein said layers contain impact modifiers, pigments, inks or additives.

21. The film according to claim 20, wherein said additive is a UV absorber or antioxidant.

22. The film according to claim 2, wherein layers (A11) and (A12) comprise a blend of polymers, exhibiting a transparent, glossy surface which is resistant to chemical or external attack or to UV.

23. The film according to claim 1, wherein said layer (A1) has a thickness of 1 to

200 µm.

24. The film according to claim 23, wherein said layer (A1) has a thickness of 5 to 140 µm.

25. The film according to claim 1 comprising fluoropolymer (A111) selected from the group consisting of: PVDF, vinylidene fluoride (VF2) homopolymer, vinylidene fluoride copolymers, trifluoroethylene (VF3) homopolymers and copolymers, and copolymers combining residues of chlorotrifluoroethylene, tetrafluoroethylene, hexafluoropropylene, and/or ethylene units and optionally VF2 and/or VF3.

26. The film according to claim 25, wherein said fluoropolymer (A111) is a blend of polymers.

27. The film according to claim 1, wherein said (A112) polymers comprise acid, acid chloride, alcohol, or anhydride functions.

28. The film according to claim 1, wherein said film is anisotropic.

29. The film according to claim 1, wherein said layer (B3) is between 10 and 250 µm.

30. The film according to claim 29, wherein said layer (B3) is between 40 and 110 µm.

31. The film according to claim 1, wherein said layer (B4) is between 400 and 800 µm.

32. The film according to claim 31, wherein said layer (B4) is between 500 and 600 µm.

33. A coated substrate produced by insert molding, co-extrusion, layering or hot-press molding a film according to claim 1 on said substrate.

34. The film according to claim 1, wherein said layers (A) and (B) are manufactured separately and hot-assembled.

33. A process for producing a thermoforming multilayer film comprising co-extruding said layers of claim 1.

34. A process for producing a thermoforming multilayer film comprising co-extruding at least two of said layers according to claim 1 and then layering on separately remaining said layers.

35. A substrate coated with a film according to claim 1, wherein the layer (B4) is next to the substrate.

36. The film according to claim 8, wherein the functionalized polyolefin of the layer (B3) is a blend comprising, by weight:

0 to 50% of at least one polyethylene or one ethylene copolymer, and
50 to 100% of polypropylene.

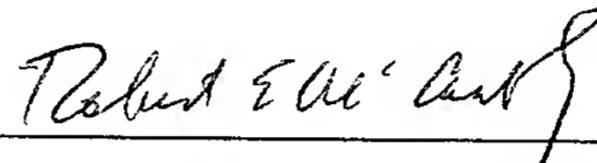
37. The film according to claim 16, wherein the functionalized polyolefin of the layer (B3) is a blend comprising, by weight:

0 to 10 to 40% of at least polyethylene or one ethylene copolymer, and
60 to 90% of polypropylene. --

R E M A R K S

The principal purpose of this Preliminary Amendment is to eliminate multiply dependent claims and the fee associated therewith. Applicants reserve the right to reintroduce claims to cancelled combined subject matter.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 1-11 have been amended as follows:

1. (Amended) A thermoforming Thermoforming multilayer film comprising, successively:

- at least one layer chosen from layers (A1) and (A2) such that if (A2) and such that, if (A2) is present, then (A2 is placed next to the optional layer (B1),

- is present, then (A2) is placed next to an optional layer (B1),

- optionally an optional layer (B1),

- a layer (B2),

- a layer (B3),

- and optionally a an optional layer (B4),

in which

wherein the said layer (A1) comprises a fluoropolymer (A111) or a polymer (A112) consisting essentially of alkyl(meth)acrylate units or a blend of the two,

the said layer (A2) consists of ink,

the said layer (B1) comprises a fluoropolymer (B111) or a polymer (B112) consisting essentially of alkyl(meth)acrylate units or a blend of the two,

the said layer (B2) is based on polyamide with amine end groups,

the said layer (B3) consists of a polyolefin functionalized with an unsaturated carboxylic anhydride, and

and the said layer (B4) is made of comprises polyolefin.

2. (Amended) Film The film according to Claim 1, in which the wherein said layer (A1) is replaced with two layers (A11) and (A12), the order of the layers being as follows:

• (A11), + (A12), + optional (A2), + optional (B1), + (B2), + (B3), + and optional (B4),

• the layer (A11) comprises a fluoropolymer (A111) or a polymer (A112) consisting essentially of alkyl (meth)acrylate units or a blend of the two,
• the layer (A12) comprises, by weight, 0 to 50% of a fluoropolymer (A111) and 50 to 100% of a polymer (A112) consisting essentially of alkyl (meth)acrylate units.

3. (Amended) Film The film according to either of the preceding claims claim 1, in which wherein said the fluoropolymer fluoropolymers (B111) and (A111) are is PVDF.

4. (Amended) Film The film according to any one of the preceding claims claim 1, wherein in which the polymer said polymers (B112) and (A112) is are PMMA.

5. (Amended) Film The film according to any one of the preceding claims claim 1, in which wherein the polyamide of the said layer(B2) is chosen from PA 6, PA 12, and PA 6/6-6 ,these polyamides containing amine end groups.

6. (Amended) Film The film according to any one of the preceding claims claim 1, in which wherein the functionalized polyolefin of the layer (B3) is grafted polypropylene optionally diluted with polypropylene, EPR rubber, EPDM rubber or copolymers of propylene and of an α -olefin.

7. (Amended) Film The film according to any one of Claims claim 1, to 5, in which wherein the functionalized polyolefin of the layer (B3) results from a co-grafting of a blend of polypropylene and of EPR or EPDM.

8. (Amended) Film The film according to any one of Claims claim 1, to 5, in which wherein the functionalized polyolefin of the layer (B3) is a blend comprising, by weight:

- 0 to 50% and preferably 10 to 40% of at least one polyethylene or one ethylene copolymer,
- 50 to 100% and preferably 60 to 90% of at least one polymer chosen from polypropylene or a propylene copolymer, poly(1-butene) homopolymer or copolymer and polystyrene homopolymer or copolymer, and preferably polypropylene,
- ~~this wherein said blend is being~~ grafted with an unsaturated carboxylic anhydride, and
- ~~this grafted wherein said-blend is~~ optionally being diluted in at least one polyolefin essentially comprising propylene units or in at least one polymer of elastomeric nature or in a blend thereof.

9. (Amended) Film The film according to ~~any one of the preceding claims~~ claim 1, ~~in which wherein~~ the polyolefin of the layer (B4) is polypropylene.

10. (Amended) Substrate A substrate coated with a film according to ~~any one of the preceding claims~~, claim 1, ~~in which wherein~~ the layer (B3) ~~or the layer (B4)~~, if it exists, is next to the substrate.

11. (Amended) Substrate The substrate according to Claim 10, ~~eonsisting~~ comprised of polypropylene.

Claims 12-37 have been added by this amendment and therefore no marked-up version is necessary.